Frontal Studies in the South China Sea: High-Resolution Hydrographic Surveys at the Shelfbreak (ASIAEX)

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LONG-TERM GOALS

We wish to understand the dynamics of the shelfbreak region in the South China Sea, a low-latitude environment with strong stratification. We would also like to understand how shelfbreak physical processes affect the propagation of sound between the continental shelf and slope, and are working closely with acousticians in this program.

OBJECTIVES

We wish to establish whether or not there is a frontal system near the shelfbreak in the South China Sea. We would also like to determine what role offshore forcing, in the form of Kuroshio Intrusions into the South China Sea, plays in setting up alongslope flows within the South China Sea.

APPROACH

We have completed a pilot study cruise on board a Taiwanese vessel within the ASIAEX experimental site. The sampling consisted of a two day SeaSoar survey, including a number of along-isobath sections, as well as two cross-shelf transects using standard CTD casts on one additional day. In addition, there was a larger-scale SeaSoar survey extending from Luzon Strait to the study area which was led by Dr. Joe Wang of National Taiwan University.

WORK COMPLETED

The cruise was successfully completed, using the SeaSoar from National Taiwan University. The hydrographic and shipboard ADCP data have been processed and distributed to other interested ASIAEX investigators.

RESULTS

The preliminary results showed two interesting and energetic features; a strong onshore flow associated with an anti-cyclonic, basin-scale circulation in the adjoining deep basin of the South China Sea, and a dense layer of water near the bottom at the edge of the continental shelf. There was a front present at the offshore edge of the dense layer, but it was beneath the surface mixed layer. Both onshore and alongslope velocities associated with the two features were quite energetic with maximum velocities between 0.5 and 1.0 m/s.

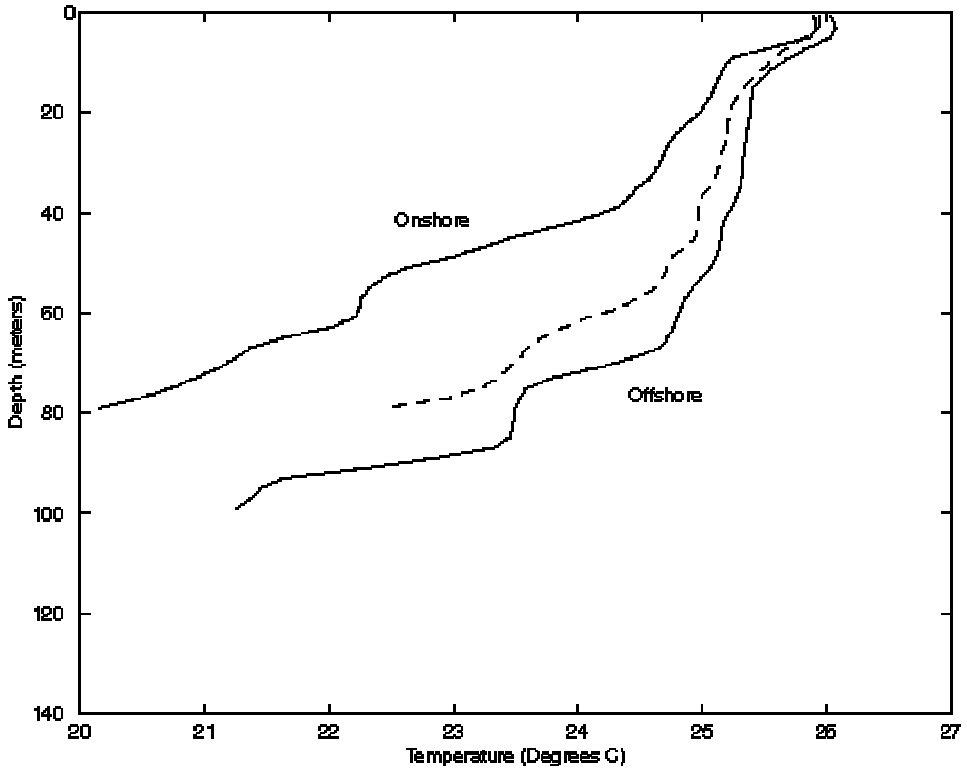

Figure 1. Vertical temperature structure from three profiles taken near the edge of the continental shelf showing the cool layer near the bottom. The station spacing was 5 km in the offshore direction. The layer was also more saline than the adjoining water offshore.

IMPACT / APPLICATIONS

The results from the pilot study are important in refining the sampling strategy for the full scale field program for ASIAEX in 2001. It will be important in seeing what processes are dominant in low-

latitude shelfbreak systems. Soundspeed fields from the pilot study have already been used by acousticians from the US and Taiwan to study sound propagation between the shelf and slope in this region.

TRANSITIONS

Data from this study has been distributed to numerical modeling groups at Harvard University and NRL-Stennis in order to improve numerical models of the region.

RELATED PROJECTS

The Shelfbreak PRIMER study is presently analyzing SeaSoar data from the shelfbreak at a mid-latitude site south of New England.

REFERENCES

None.

PUBLICATIONS

None.